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ABSTRACT

Prereading teaching strategies that help students connect schemata in their head with the information on the page are important components of reading instruction. Three prereading strategies that serve the purpose of stimulating linking activity are posing related questions, presenting reaction statements, and introducing concept stimuli. Related questions attempt to draw upon the experiences of the readers and to activate in their heads those schemata into which the major ideas in a reading selection may be integrated. Reaction statements are provocative statements related to the major concepts in the reading material that may be written on the chalkboard before the selection is read. By using stimulus association, the teacher provides a stimulus word or phrase which is chosen to reflect a major concept in the reading selection. Students are then asked to think of as many associations as they can. Moving students toward independence can be accomplished by showing them how to use the text itself to generate prior knowledge. By showing students how to integrate new information into existing schemata, teachers can help them become aware of the cognitive processes involved in reading. If there are no schemata relevant to the concepts in the text existing in the reader's head, then comprehension is impossible, and it should be concluded that the reading material is inappropriate for that particular reader. Or, content area teachers can help students construct a new schema through semantic mapping. The student who has established a relevant schema has some basis for linking new input with prior knowledge. (HOD)

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Putting Reading in Context: Pre- and Postreading Strategies for Improving Comprehension

North Carolina Council, International Reading Assoc.
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Introduction

Cognitive scientists estimate that the information capacity of the human memory is somewhere around 100 billion (10^{11}) pieces of information. The average person's memory thus contains at least 500 times as much information as the entire Encyclopaedia Britannica.

You can just imagine, then, the enormously intricate system needed to organize all this information. The human memory is organized not just alphabetically, numerically, and topically but in an intricate, interrelated series of networks. We must tap into this network, from any number of entry points and routes, in order to make sense of input from the outside world.

The printed page is a particular kind of input. A text is only a collection of ink marks on paper. It is only when some clue on the printed page activates a network in the reader's head that reading takes place.

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R. D. Anderson has described READING as the "recontextualization of print." We are going to focus on how to help the reader put the printed text in context, or tap into the network in the reader's head.

Take a moment to read the two excerpts below and answer the questions which follow them.

> In walks these three girls in nothing but bathing suits. I'm in the third checkout slot, so I don't see them until they're over by the bread. The one that caught my eye first was the one in the plaid green two-piece. She was a chunky kid with a good tan and a sweet broad soft-looking can. I stood there with my hand on a box of HiHo crackers trying to remember if I rang it up or not. I ring it up again and the customer starts giving me hell. She's one of these cash-register-watchers, a witch about fifty with rouge on her cheekbones and no eyebrows, and I know it made her day to trip me up.
>
> 1. Describe the person talking in terms of age and sex.
>
> 2. Where does the story take place?
>
> 3. What time of year does the story take place?

> The clan gathers at a festal meeting, all in their finest attire and in joyful mood. The two participants then attack one another in turn with opprobious songs to the accompaniment of a drum, each reproaching the other with his misdemeanours. No distinction is made between well-founded accusations, satirical remarks calculated to tickle the audience, and pure slander. For instance one singer enumerated all the people who had been eaten by the other's wife and mother-in-law during a famine, which caused the assembled company to burst into tears. This offensive chanting is accompanied throughout by all kinds of physical indignities directed against the other party, such as breathing and snorting into his face, bumping him with your forehead,

> prying his jaws open, tying him to a tent-pole -- all of which he has to bear with equanimity and a mocking laugh. Most of the spectators join in the refrains of the song, applauding and egging the parties on. Others just sit there and go to sleep. During the pauses the participants converse in friendly terms. The sessions may extend over a period of years, during which the parties think up new songs and new misdeeds to denounce.
>
> 1. What are the two participants trying to accomplish?
>
> 2. Why is the clan there?

Compare your ability to answer the two sets of comprehension questions. To what do you attribute the differences?

In the excerpt from the story by John Updike, we were easily able to infer that the narrator was male because of previously acquired cultural conventions we share about male-female interaction. When a common cultural context was absent, relating to the excerpt about a tribal lawsuit, we were unable to fully comprehend the passage. The generalized knowledge structures we needed to bring to the passage in both instances are called schemata or scripts.

Schemata or scripts are common knowledge structures that people build up from repeated worldly experience. One can talk about a context of organized knowledge, a web of information based on repeated events, or a script of expectations related to common cultural experiences. The metaphors vary but the basic idea is the same. Something must already be set in one's head which helps to assimilate new information coming in.

Schemata are crucial for comprehending longer units of discourse such as stories, passages, and selections. As an example of how schemata work on a simple level, take the schema we probably all have in our heads about riding a school bus. The reader reads a passage describing a child

riding on a school bus. The reader's accumulated experience, both real and vicarious, about riding a school bus, the color, size, shape, driver, etc., is brought to the printed page and enables the reader to go beyond the meaning of individual words and sentences to comprehension of the entire picture. This process occurs in the reading of simple as well as sophisticated content. There must be a match between the reader's schema and what is put on the page by the author for meaning to emerge.

Prereading Strategies

If relating what is on the page to schemata in the head is crucial to comprehension, then what the teacher does before requiring students to read is important. Prereading teaching strategies which help the student connect schemata in his head with information on the page are important components of reading instruction. Students should not be required to plunge into reading material, especially unfamiliar material, without some mental preparation. Teachers must introduce reading approaches which model the linking of prior experience with information in print. Three prereading strategies which serve the purpose of stimulating linking activity are: posing related questions; presenting reaction statements; and introducing concept stimuli. Each of these strategies are described below.

Related Question Strategy

Related questions are questions which attempt to draw upon the experience of the reader and activate those schema in his head into which the major ideas in a reading selection may be integrated. For purposes of illustration, the strategy will be described using several selections from a collection of selections for remedial college level students entitled, Structured Reading by Lynn Troyka. A short story entitled "Summer" is

about the author's inability to forget a childhood memory in which he witnessed the tragic death of a friend. Related questions which could be posed prior to reading are: "Do you have certain strong memories from childhood that you can never forget?" or "Have you ever seen something happen to someone else that you could never forget?" These questions activate relevant high-level schemata in the reader's head of unfading childhood memories or tragic memories, providing slots for more specific semantic content.

In developing the question, the teacher first reads the story or selection and pinpoints the major ideas the author conveys. (Although it is true that each individual will bring his own interpretation, we make the assumption that the teacher's maturity enables him or her to construct meaning which is close to the author's intention.) The teacher then develops a question related to the major idea but general enough to encompass a range of student experiences. The question should be both central to the story and relevant to as many students as possible.

Another selection entitled "School for Marriage" describes a high school course that prepares students for the responsibilities of marriage. Related questions for this selection could be: "Do you know someone who is sorry that they married?" or "Is marriage easy?" On an elementary level of interest, a hypothetical story about a dog's misadventures could be preceded by the related questions: "Did you or someone you know ever own a dog who always was in trouble?" or "Is it easy to own a dog in the city?" In a history textbook, a chapter about events leading to World War II could be preceded by a question such as: "What kind of problems between nations tend to lead toward confrontations?"

The teacher should encourage a brief response to related questions. The objective of this strategy is to activate a mental set, not to encourage

probing analysis of an experience. Prolonged responses also tend to divert attention from the main topic and limit the time for actual reading. The strategy of posing related prereading questions activates schemata in the reader's head, providing slots into which the particular content of the text will fit. For one student, for example, the questions posed about marriage might activate thoughts of his or her own parent's marriage and what is subsequently read will be integrated with this prior experience.

Prereading questions are not new. Teachers have been using them for the purposes of motivation for a long time. What is new is the understanding that these questions can be formulated to activate schemata or prior high-level knowledge structures in the reader's memory which are crucial to comprehension.

Reaction Statement Strategy

A second prereading strategy which functions to stimulate relevant schemata is the use of reaction statements. A provocative statement related to the major concepts in the reading material is written on the chalkboard before the selection is read. Students are asked to react to the statement in discussion or writing. In relation to the story "Summer" in which memory of a tragic death is evoked, reaction statements that could be presented are: "Forget tragic memories." or "Tragedy is good for you." Reaction statements for the story "School for Marriage" could be: "Don't marry until you're at least forty." or "Marriage is for the birds." For the hypothetical story about a dog's misadventures, reaction statements could be: "Dogs should be outlawed." or "A dog is not a man's best friend." A reaction statement for the history text chapter about problems leading to World War II could be: "Wars are inevitable."

Statements should be formulated by the teacher which will stimulate discussion among students and, at the same time, lead them to

the major points of the reading selection. Once again, limits should be set on discussion to avoid prolonged arguments and diversions. Reaction statements function in a similar way to related questions. They activate a relevant schema in the reader's head. The statement "Dogs should be outlawed," for example, might evoke memories for one student of trouble caused by a neighbor's dog and his subsequent reading of the story would be assimilated into the general mental schema of troublesome dogs.

Stimulus Association Strategy

In a third prereading strategy, the teacher provides a stimulus word or phrase which is chosen to reflect a major concept in the reading selection. Students are asked to think of as many associations as they can. Associated words are listed by each individual and grouped into related categories. Students are asked to group their words in whatever way they wish. In this task, students are locating a possible relevant schema in their head and reproducing a map of it on paper. The grouping of associated words reflects the relationships between concepts in an individual's schema. "Tragic memories" could be the stimulus for the story "Summer" and similarly, "National confrontation" could be the stimulus for the history test chapter.

For the story "School for Marriage," the stimulus word "marriage" might produce a list of associations for an individual such as: women, children, money, bad, love, wedding, ring, etc. Love, wedding, and ring might be grouped together as concepts associated with the romantic beginning of marriage and the other words might be grouped together under later responsibilities. Although there will be items in common, it is expected that each individual will construct a unique list and organize his list in unique groupings. Students can compare lists by

reading them aloud or exchanging them with their classmates. Each list reflects the schema in the head of an individual reader and the differences between lists illustrate the varied knowledge that is brought to the page by each person. Comparing lists enables students to see the unique role an individual plays in bringing meaning to print.

After repeated exposure to prereading strategies, the process of linking the known in their head with the unknown on the printed page will most likely become apparent to students. This realization should, nevertheless, be purposefully elicited by the teacher and discussed with students. After becoming aware of the necessity of drawing upon their own experience, students need to learn ways of transferring prereading strategies to independent reading. Teachers can facilitate this transfer by leading students toward self-initiated linking strategies. Moving students toward independence can be accomplished by showing them how to use the text itself to generate prior knowledge.

Self-generated Strategies

Titles, subheadings, illustrations and introductory sentences can be used by the reader to activate relevant schemata in the reader's head. For example, the teacher may focus on the title "School for Marriage" and ask students what the title could possibly mean. Student might guess it means a place which teaches people to be ministers or a course which prepares students for marriage. These type of cues in the text are part of most previewing techniques.

Sometimes, of course, titles are not helpful. The title "Summer" for the story cited previously about tragic childhood memories is too general and could lead students to generate schemata irrelevent to

the major content of the story. However, being wrong is part of the process. An expectation is set up, schemata are activated, and as the reader reads on, he or she either confirms his or her expectations or generates new ones. In other words, he abandons one schema and activates another if further reading does not produce an appropriate connection. How helpful textual cues will be is always dependent on how well organized the written text is.

Post-reading Strategies

Another way of helping students become aware of the cognitive processes involved in reading is to introduce postreading strategies in addition to prereading strategies. Postreading strategies reveal to both the teacher and the student how the student has responded cognitively to the reading experience. New information may be integrated into existing schemata in the reader's head in several ways. A simple match may occur in which the information in print is confirmed by the schema already existing and comprehension is achieved. Nothing substantially has changed in this instance.

It is also possible that partially new information is received and integrated into an existing schema. In the school bus schema described previously, we said that, hypothetically, the allowable speed of school buses was new information that could be slotted into the existing schema in the reader's head for driving school buses. In this instance, the existing schema is modified to accommodate the new input. The reader may also receive new input by creating a new related schema to accommodate it. The reader might, for example, create a driving speed schema, keeping his original school bus schema intact. In both cases of accommodation learning has occurred. Another possibility is that the reader will simply ignore new input. This is most likely to occur when the new information

seems incompatible with the existing schema to the reader. Postreading strategies reveal the processes which have taken place, confirming comprehension and learning. In other words, they enable students to become aware of their own cognitive behaviors.

A logical postreading strategy is to reintroduce the same stimulus words and reaction statements presented before reading after reading and compare the response differences. For example, students may be asked if any of the associations they listed for "marriage" before reading were related to what they read, and, if not, what associations they would now make. An individual reader may have included love, ring, and money on his first list but not budgeting or in-law problems which are discussed in the selection. By examining these new items appearing on his second list, the reader realizes what has been learned. The reader learns that he or she has accommodated the schema for marriage to include this new information. In response to the statement "Don't marry until you're at least forty," a student may have responded with agreement prior to reading. After reading, the student's response may have been qualified by "unless you have been educated to the problems of marriage beforehand."

Changed responses show that schemata were altered in memory as a result of reading comprehension. Giving students the opportunity to examine change helps them become aware of their own learning process. If there is no change, students also learn something. They see that reading confirmed what they already knew or that they were unaffected by the reading experience.

Another postreading strategy involves asking students to summarize in a brief written paragraph the essential points of what they read. Students then compare their summaries with their prereading

responses in a procedure similar to the one already described. It is wise for teachers to note whether the summaries of students are verbatim responses or paraphrases of what was stated in the reading selection. If the responses are found to be verbatim statements, students should be asked to rephrase their summaries in their own words. This enables the teacher to see if students have actually comprehended what they read or are parroting words from memory. Postreading responses need not be limited by the teacher. This is an appropriate opportunity for students to analyze their thoughts.

Absence of Relevant Schemata

What if there are no schemata relevant to the concepts in the text existing in the reader's head? In such cases, comprehension is impossible and it should be concluded that the reading material is inappropriate for that particular reader. In other words, information largely alien to the experience of the reader cannot be learned from the printed page. Try reading a text about subatomic quarks, for example. If nuclear physics is an alien field of knowledge for you, comprehension will be difficult, if not impossible. You would have to consult a more elementary text or an expert in the field. Frequently, students are confronted with reading content that is as alien to them as subatomic quarks are to us.

Reading only confirms and expands knowledge. Books cannot impart knowledge from scratch and are usually not designed to function as teachers. Unfortunately, many content area instructors do not realize this and rely almost exclusively on textbook reading assignments to teach students a subject. Only the most persevering student can succeed under these circumstances. This student seeks other sources on his or her own. Those students who do not, simply flounder.

Constructing A Schema

The content area teacher can help students construct a new schema for a topic to be introduced in the textbook. The prereading approach of using stimulus words can be used and expanded upon by the content area teacher. The aim is to help students construct schemata for a particular topic, if they do not already have this knowledge. The teacher selects a stimulus word that represents the major concept to be conveyed. The word is written on the chalkboard and students are asked to contribute associations. The teacher creates the semantic map on the board using the collective knowledge of the class.

A formal semantic map is a theoretical construct of how stored information in the mind is organized. It consists of nodes representing the concept and links between concepts representing the relations between each concept. In a semantic map, associated concepts are related to the major node by example relations, class relations, and property relations. If cat were the major node in a semantic map, Snip and Tippy could be example relations; animal and pet could be class relations; and purr and hair could be property relations.

Pearson and Johnson (1978) have simplified and summarized the theories about semantic maps. In their semantic map of the concept Federal, federal is enclosed in a central large circle; the example relation Canadian Government is enclosed in a smaller circle; the property relations states and executive are enclosed in squares; and the class relation Forms of Government are enclosed in the largest circle. The exact form, however, is not important.

The significance of using this approach is that the teacher is providing the opportunity for a student to begin a schema using the collective knowledge of the class. The teacher is also modeling a

technique for organizing information in memory. Students experiencing this process before reading are more likely to comprehend and learn from what they read than those confronted with pages of printed material without preparation. The student who has established a relevant schema in his head has some basis for linking new input with prior knowledge.

Summary

Pre- and postreading strategies, consistent with a psycholinguistic understanding of the reading process, can take a variety of forms. Only a few approaches have been described on these pages. Relations between printed information and prior knowledge can be made explicit before reading by using stories, topics, headings, metaphors, examples, pictures, charts, graphs, experiential tasks and guide questions. Directed discovery learning techniques, advanced organizers, study guides and study methods are compatible with the view of discourse comprehension we have described.

Prereading strategies have been advocated in the past primarily because they motivate. They excite student interest in a topic or story and instill confidence in the reader because he learns that he knows something even before he reads. Prereading strategies are now understood to have a fundamental function in cognitive processing as well. They provide a facilitative context for comprehension. Postreading techniques, on the other hand, have generally been used to test what the reader has comprehended. Comparing the responses from postreading strategies with prereading responses as we have advocated enables us to see both what the reader has comprehended and what he has learned. Both the teacher and the students are able to see if the knowledge structures in the reader's head were modified to accommodate new information, in other words, whether learning took place.

We need to be aware of and understand the reading comprehension process as the recontextualization of print. Once this understanding is achieved, it is not difficult to find and incorporate prereading strategies which help the student draw upon his prior store of knowledge and postreading strategies which confirm comprehension and learning. Many teachers will discover that they have instinctively been using pre- and post- reading techniques which facilitate comprehension. Others will find that they can easily do so.